

Blue-Green Algae Task Force Consensus Document #1
11 October 2019

The Blue-Green Algae Task Force is an advisory body, appointed by Governor Ron DeSantis, to aid the Department of Environmental Protection in fulfilling its mission to protect, conserve and manage the state's natural resources and enforce its environmental laws. The task force, through its discussion and deliberations, provides guidance and specific, science-based recommendations with the goal of expediting improvements and restoration of Florida's water bodies that have been adversely affected by blue-green algae blooms.

Increased delivery of nutrients to Florida's water bodies is widely recognized as the primary driver of algal proliferation and subsequent degradation of aquatic ecosystems. Major sources of nutrients include, but are not limited to, agricultural operations, wastewater treatment plants, onsite sewage disposal systems and urban storm water runoff. Legacy nutrients, i.e. nitrogen and phosphorus sequestered in soils, groundwater and sediments, contribute also to excessive nutrient loading of surface waters throughout the state. Nutrient effects, as they relate to the formation, magnitude and persistence of blue-green algae blooms in Florida's waters, are expected to be exacerbated by regional changes in land-use, associated alterations in hydrology as well as climate change, specifically increases in temperature and pronounced variability in precipitation patterns. The Department of Environmental Protection, by nature of its regulatory authority, is the primary state agency responsible for establishing, implementing and enforcing rules intended to prevent nutrient over-enrichment and resultant negative environmental impacts. To facilitate task force discussion and deliberation, members were provided with an overview of current and relevant regulatory programs and DEP responsibilities. Also provided was important information bearing on specific topics as set forth in meeting agendas in order to promote a fuller understanding of existing regulatory constraints and knowledge gaps that otherwise hinder effective policy and management.

To date, the task force has convened on five separate occasions to discuss the issue of nutrient over-enrichment and blue-green algal blooms. Focus has been placed on source identification, nutrient reduction and remediation efforts with additional guidance provided on innovative technologies as they relate to the prevention, cleanup and mitigation of harmful algal blooms. Most recently, the task force has considered the issue of algal toxins and human health impacts to identify knowledge gaps and research priorities.

The following high-level summary of key topics discussed during the initial five meetings of the task force highlights areas where additional study and/or policy and regulatory reform are warranted. Where appropriate, contextual information precedes consensus statements and recommendations designed to inform policy decisions, regulatory actions and/or strategic investments in improved knowledge in the near term. Focus thus far has been on South Florida systems; however, future meetings of the task force will consider all water in Florida and will delve into other important issues including, for example, wastewater, water reuse, biosolids, fertilizers in urban landscapes, the role of conservation lands and wetlands in maintaining water quality, and application of herbicides. Additional recommendations are forthcoming.

Basin Management Action Plans

Basin Management Action Plans (BMAPs) are restoration road maps with an identified suite of projects/actions collectively intended to reduce pollutants to achieve a restoration target. These broad-based plans are developed in collaboration with local stakeholders, i.e. they rely on local input and local commitment, and they are adopted by Secretarial Order to be enforceable. A strategic implementation of any of the DEP approved plans is hindered in large part, however, by local funding constraints that dissuade commitments by otherwise willing partners to execute identified projects. As a consequence, delays in the anticipated time to achieve a specific restoration target within BMAP areas have occurred. Moreover, the effectiveness of specific projects has not been regularly

and rigorously assessed due to a lack of available monitoring data, calling into question returns on investment.

To accelerate progress toward achieving restoration targets in BMAP areas, the Blue-Green Algae Task Force recommends a more strategic approach to project selection, implementation and monitoring. With regard specifically to the Lake Okeechobee, Caloosahatchee Estuary and St. Lucie River and Estuary BMAP areas, the task force acknowledges regional storage and treatment infrastructure is urgently needed to manage flows to reduce damaging freshwater discharges to the northern estuaries, and also to achieve Total Maximum Daily Loads (TMDLs) as well as established Numeric Nutrient Criteria (NNC). Accordingly, the task force recommends that siting, design and funding of this infrastructure be a priority.

The task force recognizes that rapidly changing demographics, alterations in land use and altered hydrology obfuscate the BMAP process. Nevertheless, projections of such changes should be incorporated, where possible, into the BMAP process to identify projects/actions that could compromise or enhance ongoing restoration efforts. Such projections could be used also to inform future land use planning and permitting.

BMAPs should acknowledge the nutrient reductions needed to be protective of downstream water bodies. By way of example, the task force recommends that total nitrogen (TN) reductions should be identified for Lake Okeechobee to protect the northern estuaries, i.e. the Caloosahatchee and St. Lucie River estuaries. Similarly, the task force recommends that a total phosphorus (TP) TMDL, total nitrogen (TN) TMDL and BMAP be established for the Upper St. Johns River basin.

Legacy nutrients, as indicated previously, are a concern in the South Florida landscape, and the task force recommends that their contribution to loading figure prominently in the Lake Okeechobee, Caloosahatchee and St. Lucie River and Estuary BMAPs. The task further recommends that projects with the demonstrated potential to expedite legacy nutrient removal merit special attention and be designated as priority projects.

In that same vein, the task force recommends spatially focused suites of projects in areas likely to yield maximum pollutant reduction be identified and prioritized in all BMAP areas. Integrated monitoring and modeling of implemented BMAP projects should be conducted to ensure that projects are working as expected. Such efforts are, in fact, key to the assessment process and allow for adjustments to be made if necessary.

Agriculture and Best Management Practices

Agriculture contributes significantly to Florida's economy and provides a broad suite of services beyond the simple provision of food and fiber. Examples of such services in well-managed agricultural landscapes include soil conservation, carbon sequestration, water storage and treatment, aquifer recharge, wildlife habitat and biodiversity conservation. Depending on the sector and the on-site management practices employed, agriculture can also negatively impact the environment. Some examples of disservices attributed to agriculture include soil erosion and sedimentation of waterways, increased nutrient leaching and runoff, and subsequent groundwater contamination and eutrophication of surface waters, loss of wildlife habitat and reduced biodiversity.

In watersheds where agriculture is the predominant land use, it should not be surprising that agriculture is also the dominant source of both phosphorus and nitrogen. Such is the case within the Lake Okeechobee watershed and a number of other BMAP areas. Best management practices (BMPs) were developed, in part, to reduce water and nutrient losses to the environment while maintaining production. The adoption and implementation of BMPs is statutorily required within BMAP areas and presumed to result in reduced environmental impacts. Despite the statutory requirement indicated above, only 75% of eligible agricultural parties within the Lake Okeechobee BMAP area are enrolled in an appropriate BMP. Enrollment numbers are considerably less in other BMAP areas.

The Blue-Green Algae Task Force believes that full compliance with the statute is necessary to realize the nutrient reduction benefits as projected in the BMAP

process to achieve a TMDL. The task force recommends funding and action to increase BMP enrollment in all BMAP areas to ensure that the maximum environmental benefit is achieved. However, enrollment in of itself does not ensure compliance. It is critical that all agricultural producers enrolled in BMP programs maintain accurate records, as articulated in the various BMP manuals, to demonstrate that they are implementing BMPs and that those records be verified and made available to the appropriate authorities for analysis and review.

The Blue-Green Algae Task Force recognizes that BMPs are necessary but not sufficient in many areas to achieve water quality targets established within BMAP areas. Nevertheless, the task force recommends that the effectiveness of BMPs be supported by adequate data to justify the presumption of compliance with water quality standards granted upon enrollment and implementation. There are limited data available outside of the Everglades Agricultural Area (EAA) that demonstrate environmental benefits of BMPs. Such data are recognized by the task force as an essential element of a comprehensive and science-based water quality restoration program that is progressive and adaptive in nature. Accordingly, the task force recommends that each Notice of Intent (NOI) to adopt BMPs be accompanied by an estimate of input reduction and load reduction associated with adopting these practices. Reporting of input reductions for all operations receiving a presumption of compliance and the implementation of sampling programs to assess the effectiveness of sector specific BMPs intended to reduce nutrient loading to adjacent water bodies should be initiated.

The task force recommends that existing BMP manuals be subject to regular review and revision to achieve a greater environmental benefit; improved water quality, in particular. Advanced technologies that reduce leaching and runoff of nutrients and the subsequent delivery of those nutrients to groundwater or adjacent surface waters should be incorporated into revised and updated BMP manuals as appropriate. The current effort by the Florida Department of Agriculture and Consumer Services (FDACS) to update BMP manuals should be accelerated.

Human Waste - Onsite Sewage Treatment and Disposal Systems

The task force recognizes that conventional onsite sewage treatment and disposal systems, i.e. septic systems, were designed to manage human health risks associated with the introduction of pathogens to the environment. Accordingly, they have been and continue to be permitted and regulated by the Florida Department of Health (DOH). However, septic systems are also a well-known and substantial source of nutrients to groundwater and surface waters across the state. There are, in fact, more than 2.5 million septic systems in Florida that treat approximately one-third of the wastewater generated in the state. The nutrients in the effluent from these systems contributes to the development and maintenance of harmful blue-green algae blooms.

The task force recommends broader regulatory oversight of onsite sewage treatment and disposal systems to ensure that those systems function properly, protect the environment against nutrient pollution and are protective of human health. The Department of Environmental Protection should develop a comprehensive regulatory program to ensure that onsite sewage treatment and disposal systems, where appropriate, are sized, designed, constructed, installed, operated and maintained to prevent nutrient pollution, reduce environmental impact and preserve human health.

Underperformance of onsite sewage treatment and disposal systems is a concern. Poorly functioning and/or failing septic systems can contribute disproportionately to nutrient pollution and pose increased health risks. The task force recommends the development and implementation of a septic system inspection and monitoring program with the goal of identifying improperly functioning and/or failing systems so that corrective action can be taken to reduce nutrient pollution, negative environmental impacts and preserve human health. At present there is no requirement that conventional septic systems be inspected post-installation.

Current regulations prohibit permitting of new septic systems on lots of 1 acre or less in a priority focus area within an Outstanding Florida Spring watershed unless

the system includes enhanced treatment. The task force recommends broader adoption of this rule to protect other vulnerable areas across the state. The task force further recommends legislation and funding to accelerate cost-effective septic to sewer programs with the aim of reducing nutrient pollution that leads to harmful algal blooms.

Human Waste - Sanitary Sewer Overflows

Sanitary sewer overflows (SSOs) are both a direct human health concern and a source of localized nutrient pollution. SSOs can, in fact, result in significant downstream environmental impacts including harmful algal blooms. Sea-level rise and changes in precipitation patterns, including the occurrence of more frequent and intense rainfall events, storm surge and high tide events, are problematic for Florida's already challenged water infrastructure. An increase in the occurrence of SSOs is likely if said problems are not addressed. The task force recommends that every effort should be made to minimize the occurrence of SSOs and their potential negative environmental and health impacts.

Acute power failure during storm events and hurricanes is a leading cause of SSOs and unpermitted discharges. Thousands of lift stations across the state were constructed prior to 2003 and are not required to have an emergency back-up power source. To alleviate the risk of an SSO due to power failure, the task force recommends that emergency back-up capabilities be identified for all lift stations constructed prior to 2003.

Infiltration and Inflow (I&I) is also a major cause of SSOs during storm events. Leaky infrastructure can present a problem also during non-storm times, as wastewater can leave pipes and enter the environment through the same leaks that water enters the pipes during storm events. The problem, however, is difficult to manage under the state's current regulatory framework and corrective action is largely reactionary. The task force recommends that the Department of Environmental Protection pursue a more proactive approach to address I&I issues to reduce the risk of SSOs and associated water quality degradation.

Stormwater Treatment Systems

The presumption that a stormwater treatment system constructed and permitted in compliance with BMP design criteria will not cause or contribute to violations of surface water quality standards in adjacent and/or connected water bodies has been evaluated and challenged. Available data suggest that a substantial number of stormwater treatment systems throughout the state fail to achieve their presumed performance standards.

Given the quantity of water collected, treated and conveyed in stormwater systems throughout the state, the task force recommends the development and implementation of a stormwater system inspection and monitoring program with the goal of identifying improperly functioning and/or failing systems so that corrective action can be taken to reduce nutrient pollution and other negative environmental impacts. The task force recommends also that stormwater design criteria be revised and updated to incorporate recent advances in stormwater treatment technologies and other practices that have demonstrated environmental benefits, specifically nutrient reduction.

Innovative Technologies and Applications

A broad suite of innovative technologies is potentially available to aid in the prevention, cleanup and mitigation of harmful algae blooms. Technologies, however, vary widely in approach (biological, chemical and/or mechanical in nature), scalability and cost.

The task force recommends an investment in a diverse portfolio of technologies, focusing on those that are demonstrably cost-efficient, environmentally safe and scalable. Technologies that are focused on cleanup and mitigation of blue-green algae blooms, though important, are event driven and should not consistently dominate expenditures. Technologies with a prevention focus are desirable and will require more strategic and longer-term investments. The task force recommends also investments in technologies with the potential to detect, monitor and forecast harmful algal blooms to enable more proactive response.

Finally, the task force encourages an investment in a program to aid in the development and/or implementation of technologies to reduce nutrients and/or harmful algae.

Blue-Green Algae Blooms and Public Health

Public health issues as they relate to blue-green algae blooms are an increasing concern in Florida, though the science bearing on those concerns is quite limited and not well-developed. Of particular importance and urgent need are studies that address acute and chronic health effects of exposure of humans, wildlife and domesticated animals to algal toxins. An essential component of such studies is ready access to quantitative data on algal toxins in water, sediments and air. Accordingly, the task force recommends that regular and proactive sampling for algal toxins be incorporated strategically into existing and future water quality sampling/monitoring programs (see below).

Defensible health advisories should be established by the Florida Department of Health and defensible water quality criteria should be established by the Florida Department of Environmental Protection. These actions should be supported by the best available science and monitoring, and updated as new information becomes available. The task force further recommends that the Department of Health work collaboratively with the Department of Environmental Protection to implement a transparent, consistent and comprehensive communication plan that recognizes the diverse population in Florida in order to inform the public about the potential health impacts associated with exposure to algae and/or algal toxins.

Science-based Decision Making, Data Needs and Monitoring Programs

The task force recognizes that renewed investment in a state-wide comprehensive water quality monitoring strategy will be a key part of its water quality protection efforts moving forward. Appropriately scaled monitoring data allow water resource managers to evaluate the effectiveness of specific actions/projects intended to provide environmental benefit and are expected to be an essential part of the

Department of Environmental Protection's science-based decision-making process. Accordingly, the task force recommends that monitoring programs be designed to address status and trends for key water quality parameters. Monitoring efforts should also be employed to answer specific questions, address unknowns, allow for improved design and adaptive management of agricultural and urban BMPs, edge of field and regional projects and BMAPs. Greater investments in research will be required to inform monitoring efforts.

Given the current focus on blue-green algal blooms in Lake Okeechobee and northern estuaries, i.e. Caloosahatchee and St. Lucie, the task force recommends an expanded water quality monitoring program in each of the relevant BMAP areas to identify priority areas for project implementation and for subsequent evaluation of project effectiveness in achieving nutrient load reductions. Comparable monitoring and assessment programs should be established in other BMAP areas across the state.

The task force recommends that additional environmental parameters, e.g., multiple nitrogen species and algal toxins, be incorporated where appropriate into monitoring programs to aid our collective understanding of the factors that lead to the development, maintenance and senescence of harmful algal blooms and toxin production.